

PERFORMANCE TASK: “HOW MANY TENS?”

(Adapted from Sarah Marshall, Henry County Schools, and NZ Maths)



STANDARDS FOR MATHEMATICAL CONTENT

MCC.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
6. Attend to precision.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

This task is designed to develop the concept of what happens to a number when multiplied by a multiple of ten. To help build context, the teacher may read *100 Hungry Ants* by J. Pinzces. Students need to know that 10 tens make 100 and 10 hundreds make one thousand.

ESSENTIAL QUESTIONS

- What happens to a number when it is multiplied by ten?
- How can I model multiplication by ten?
- What strategies can I use to multiply single digit numbers by multiples of ten?

MATERIALS

- Money Manipulatives
- “How many 10s” recording sheet

GROUPING

Students should work in groups of 3 to 4 members.

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I

Read the book, *100 Hungry Ants* by J. Pinzces to your students. During strategic points throughout the book, stop to discuss how the number 100 can be built or created from different groups of ten. (This is a perfect “anchor chart” opportunity!) Facilitate a classroom discussion about tens and hundreds to assess prior knowledge, and use this as a platform for a brief mini-lesson (if needed). Have the students work with their small groups to investigate, model (very important), and figure out the following problems:

1. What are all of the possible ways the ants could have lined up (by multiples of 10) to reach the picnic?
2. What would have been the QUICKEST way for the ants to march to the picnic so they could have gotten there before all of the food was gone?

Part II

Read the scenario to the students.

Problem: The Bank of Mathematics has run out of \$100 bills. Alison wants to withdraw \$300 in \$10 dollar bills. How many \$10 dollar bills does she get? Can you figure out how many \$10 bills she will need with different amounts such as \$600 or \$900?

Students will record answers in the “How Many Tens” table.

Repeat the same concept using the scenario below and \$10 and \$1 bills.

Problem: The Bank of Mathematics has run out of \$100 bills. Alison wants to withdraw \$256 in \$10 and \$1 bills. How many of each bill will she receive?

Students will record answers in “How Many Tens” table.

FORMATIVE ASSESSMENT QUESTIONS

- How did you determine how many tens to give?
- What if you didn’t have any tens, what could you use?
- How does Multiplication help you determine the amount of tens needed to withdraw?

DIFFERENTIATION

Extension

- Students can determine the number of ones, then tens, then hundreds it would take to reach various student-suggested amounts. Organize the information into a student-created table, look for patterns, and explain what you see.

Intervention

- Students can complete this activity with smaller amounts of money.
- Students can complete only the first part of the recording sheet.
- Students can complete the second part of the recording sheet with amounts rounded to the nearest hundred.
- If needed, students can complete this task with teacher guidance.

Recording Sheet: How Many Tens?



Problem#1: The Bank of Mathematics has run out of \$100 bills. Alison wants to withdraw \$300 in \$10 dollar bills. How many \$10 dollar bills does she get? Can you figure out how many \$10 bills she will need with different amounts such as \$600 or \$900?

How Many Tens?

| Withdraw | How many \$10.00 bills? |
|----------|-------------------------|
| \$300.00 | |
| \$600.00 | |
| \$900.00 | |
| \$700.00 | |
| \$500.00 | |
| \$200.00 | |
| \$800.00 | |

Question for reflection:

How did you determine the amount of \$10.00 bills needed?

Problem#2: The Bank of Mathematics has run out of \$100 bills. Alison wants to withdraw \$256 in \$10 bills. How many of each bill will she receive?

How Many Tens and Ones?

| Withdraw | \$10.00 | \$1.00 |
|----------|---------|--------|
| \$256.00 | | |
| \$352.00 | | |
| \$468.00 | | |
| \$853.00 | | |
| \$523.00 | | |
| \$631.00 | | |
| \$750.00 | | |

Question for reflection:

How did you determine the amount of \$1.00 and \$10.00 bills needed?

Extension Problem:

Tickets to a concert cost \$100 each. How many tickets could you buy if you have \$3215?